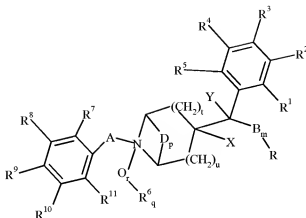


**WHAT IS CLAIMED IS:**

1. A compound of formula I:

**I**

wherein;

m, q, r, t and u are independently selected from 0 or 1; and p is 0, 1, 2, or 3;

X is selected from halogen, hydroxyl, hydroxyalkyl, alkyl, alkoxy, haloalkyl, haloalkoxy, thio, alkylthio, acetoxyalkyl, azidoalkyl, aminoalkyl, acetylaminoalkyl, alkylsulfonyl, alkylsulfoxy, pentahalothio, cyano, nitro, acetyloxy, alkylsulfonyloxy, alkylcarbonyl, alkoxy carbonyl, aryl, or aryloxy;

Y is selected from hydrogen, halogen, alkyl, haloalkyl, hydroxyl, hydroxyalkyl, alkoxy, haloalkoxy, thio, alkylthio, pentahalothio, cyano, nitro, alkylsulfonyl, alkylsulfonyloxy, alkylcarbonyl, alkoxy carbonyl, aryl, or aryloxy;

or

X and Y taken together with  $-\text{OCR}^{12}\text{R}^{13}\text{O}-$ , form a 1,3-dioxolane ring;

where

$\text{R}^{12}$  and  $\text{R}^{13}$  are independently selected from hydrogen, halogen, alkyl, haloalkyl, hydroxyalkyl, alkoxy, haloalkoxy, alkylthio, cyano, nitro, alkylsulfonyloxy, alkylcarbonyl, alkoxy carbonyl, aryl, or aryloxy;

or

R<sup>12</sup> and R<sup>13</sup> taken together with (=O), form 1,3-dioxol-2-one ring;

R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, and R<sup>5</sup> are independently selected from hydrogen, halogen, alkyl, haloalkyl, hydroxyl, hydroxyalkyl, alkoxy, haloalkoxy, thio, alkylthio, haloalkylthio, pentahalothio, cyano, nitro, alkylsulfonyl, haloalkylsulfonyl, alkylsulfinyl, haloalkylsulfinyl, alkylsulfonyloxy, haloalkylsulfonyloxy, alkylcarbonyl, alkoxy carbonyl, dialkoxyalkylcarbonyl, alkoxy carbonylamino, alkylaminoxyalkyl, alkoxyiminoalkyl, alkenyloxyiminoalkyl, aryl, aryloxy, dioxanyl, dioxolanyl or either of R<sup>1</sup> and R<sup>2</sup>, or R<sup>2</sup> and R<sup>3</sup>, or R<sup>3</sup> and R<sup>4</sup>, or R<sup>4</sup> and R<sup>5</sup> taken together with –OC(R<sup>19</sup>)<sub>2</sub>O–, –OC(R<sup>19</sup>)<sub>2</sub>(R<sup>19</sup>)<sub>2</sub>O–, –OC(R<sup>19</sup>)<sub>2</sub>(R<sup>19</sup>)<sub>2</sub>–, –OC(R<sup>19</sup>)=N–, or –SC(R<sup>19</sup>)=N–, forming a benzo-fused ring, where R<sup>19</sup> is hydrogen, halogen, alkyl or haloalkyl; and, wherein at least one of R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, and R<sup>5</sup> is other than hydrogen;

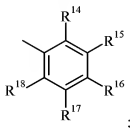
R<sup>7</sup>, R<sup>8</sup>, R<sup>9</sup>, R<sup>10</sup>, and R<sup>11</sup> are independently selected from hydrogen, halogen, alkyl, hydroxy, hydroxyalkyl, hydroxyalkoxy, alkoxy, alkoxyalkyl, alkoxyiminoalkyl, haloalkoxyiminoalkyl, cyanoalkoxyiminoalkyl, cyanoiminothioalkylamino, alkenyloxyiminoalkyl, alkynyloxyiminoalkyl, cycloalkoxy, cycloalkylalkoxy, phenoxy, alkoxy carbonylphenoxy, alkoxyalkoxy, alkoxyalkoxyalkoxy, alkylthio, alkylsulfonyl, alkylaminosulfonyl, dialkylaminosulfonyl, cycloalkylaminosulfonyl, alkenyloxy, alkynyloxy, haloalkenyloxy, alkylsulfonyloxy, optionally substituted arylalkoxy, cyano, nitro, amino, alkylamino, alkylcarbonylamino, alkoxy carbonylamino, cycloalkylalkoxy carbonylamino, alkenyloxy carbonylamino, alkynyloxy carbonylamino, haloalkylcarbonylamino, alkoxyalkoxy carbonylamino, alkoxy carbonylamino, alkoxy carbonyloxy, alkenylaminocarbonyloxy, alkynylaminocarbonyloxy, (alkyl)(alkoxy carbonyl)amino, alkylsulfonylamino, optionally substituted (heteroaryl)(alkoxy carbonyl)amino, optionally substituted arylcarbonylamino, alkoxy carbonyl, alkylaminocarbonyloxy, alkylaminocarbonylamino, dialkylaminocarbonylamino, alkylamino(thiocarbonyl)amino, dialkylphosphoreidyl, acetoxyalkoxy, sulfonyloxyalkoxy, dialkoxyalkoxy, trialkoxyalkoxy, dialkoxyalkylacetal, trialkoxymethylorthoester, cyclic acetal, optionally substituted cyclic acetal,

optionally substituted thienyl, optionally substituted 1,3-thiazolylalkoxy, optionally substituted aryl, optionally substituted aryloxy, optionally substituted aryloxyalkyl, optionally substituted arylaminocarbonyloxy, optionally substituted arylalkoxycarbonylamino, optionally substituted heteroaryl, optionally substituted heteroaryloxy, optionally substituted pyrrolyl, optionally substituted pyrazolyl, optionally substituted pyrazinyloxy, optionally substituted cycloalkylcarbonylamino, optionally substituted 1,3-oxazoliny, optionally substituted 1,3-oxazolinyloxy, optionally substituted 1,3-oxazolinylamino, optionally substituted 1,2,4-triazolyl, optionally substituted 1,2,3-thiadiazolyl, optionally substituted 1,2,5-thiadiazolyl, optionally substituted 1,2,5-thiadiazolyloxy, optionally substituted 2H-tetrazolyl, optionally substituted pyridyl, optionally substituted pyridyloxy, optionally substituted pyridylamino, optionally substituted pyrimidinyl, optionally substituted pyrimidinyloxy, optionally substituted 3,4,5,6-tetrahydropyrimidinyloxy, optionally substituted pyridazinyloxy, or optionally substituted 1,2,3,4-tetrahydronaphthalenyl, wherein the optional substituent is selected from one or more of halogen, alkyl, haloalkyl, alkoxy, cyano, nitro, amino, alkylcarbonyl, alkoxy carbonyl, alkoxyiminoalkyl, dialkylacetal, alkylthiol, alkylsulfoxide, or alkoxy carbonylamino; and, wherein at least one of  $R^7$ ,  $R^8$ ,  $R^9$ ,  $R^{10}$ , and  $R^{11}$  is other than hydrogen;

R is alkyl, cycloalkyl, alkenyl, alkoxy carbonyl, optionally substituted pyrid-2-yl wherein the optional substituent is selected from hydrogen, halogen, haloalkoxy or haloalkyl,

or

substituted phenyl have the following structure,



where

$R^{14}$ ,  $R^{15}$ ,  $R^{16}$ ,  $R^{17}$ , and  $R^{18}$  are independently selected from hydrogen, halogen, alkyl, haloalkyl, hydroxyl, hydroxyalkyl, alkoxy, haloalkoxy, thio, alkylthio, haloalkylthio, pentahalothio, cyano, nitro, alkylsulfonyl, haloalkylsulfonyl, alkylsulfinyl, haloalkylsulfinyl, alkylsulfonyloxy, haloalkylsulfonyloxy, alkylcarbonyl, alkoxy carbonyl, dialkoxyalkylcarbonyl, alkoxy carbonylamino, alkylaminoxyalkyl, alkoxyiminoalkyl, alkenyloxyiminoalkyl, aryl, aryloxy, dioxanyl, dioxolanyl or either of  $R^{14}$  and  $R^{15}$ , or  $R^{15}$  and  $R^{16}$ , or  $R^{16}$  and  $R^{17}$ , or  $R^{17}$  and  $R^{18}$  taken together with  $-\text{OC}(\text{R}^{19})_2\text{O}-$ ,  $-\text{OC}(\text{R}^{19})_2(\text{R}^{19})_2\text{O}-$ ,  $-\text{OC}(\text{R}^{19})_2(\text{R}^{19})_2-$ ,  $-\text{OC}(\text{R}^{19})=\text{N}-$ , or  $-\text{SC}(\text{R}^{19})=\text{N}-$ , forming a benzo-fused ring, where  $R^{19}$  is hydrogen, halogen, alkyl or haloalkyl; and, wherein at least one of  $R^{14}$ ,  $R^{15}$ ,  $R^{16}$ ,  $R^{17}$ , and  $R^{18}$  is other than hydrogen;

A is selected from  $-\text{CH}_2-$ ,  $-\text{CH}_2\text{CH}_2-$ ,  $-\text{CH}_2\text{CH}_2\text{CH}_2-$ ,  $-\text{OCH}_2\text{CH}_2-$ ,  $-\text{OCH}_2\text{CH}_2\text{CH}_2-$ ,  $-\text{OCH}_2\text{CH}_2\text{CH}_2\text{CH}_2-$ ,  $-\text{OCH}_2\text{CH}(\text{OH})\text{CH}_2-$ ,  $-\text{NHCH}_2\text{CH}_2-$ ,  $-\text{N}(\text{CH}_3)\text{CH}_2\text{CH}_2-$ ,  $-\text{N}[\text{C}(=\text{O})\text{CH}_3]\text{CH}_2\text{CH}_2-$ , or  $-\text{N}[\text{C}(=\text{O})\text{OCH}_3]\text{CH}_2\text{CH}_2-$ ;

B is selected from  $-\text{O}-$ ,  $-\text{S}-$ ,  $-\text{CH}_2\text{O}-$ ,  $-\text{OCH}_2-$ ,  $-\text{OC}(=\text{O})\text{NH}-$ ,  $-\text{OC}(=\text{O})\text{O}-$ , or  $-\text{NHSO}_2-$ ;

when p is 1, 2, or 3;

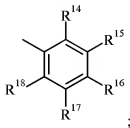
D is  $-\text{CH}_2-$ ;

$R^6$  is selected from alkyl, haloalkyl, hydroxyalkyl, alkoxyalkyl, dialkylaminoalkyl, alkylaminocarbonyloxyalkyl, alkylthioalkyl, alkylsulfonylalkyl, alkylcarbonyloxyalkyl, alkoxy carbonylalkyl, carboxyalkyl, arylalkyl, arylcarbonyl, sulfonato, or sulfonatoalkyl, and may bear a negative charge resulting in an inner salt; and a separate ion is chloride, bromide, iodide, or an alkyl or phenyl sulfate or sulfonate;

and

agriculturally-acceptable salts thereof.

2. The compound of claim 1, wherein m, q and p are 0; t and u are 1; A is  $-\text{CH}_2-$ ; X is selected from halogen, hydroxyl or alkoxy carbonyl; Y is selected from hydrogen, halogen or hydroxyl;  $\text{R}^1$ ,  $\text{R}^2$ ,  $\text{R}^3$  and  $\text{R}^4$  are independently selected from hydrogen, halogen, alkyl, alkoxy, haloalkyl, haloalkoxy,  $-\text{CH}_2(\text{OH})\text{CH}_3$ ,  $-\text{CH}=\text{NOC}_2\text{H}_5$ , 1,3-dioxolan-2-yl, or  $\text{R}^2$  and  $\text{R}^3$  taken together with  $-\text{OCF}_2\text{O}-$ ;  $\text{R}^5$  is hydrogen;  $\text{R}^7$ ,  $\text{R}^{10}$  and  $\text{R}^{11}$  are hydrogen;  $\text{R}^8$  is selected from hydrogen, halogen, alkyl or alkoxy;  $\text{R}^9$  is selected from alkoxy, alkoxyalkoxy, alkoxyalkoxyalkoxy, cyclopropylmethoxy, 2-halophenoxy, 3-halophenoxy, 4-halophenoxy, pyrimidin-2-yl, pyrid-2-yl, 3-halo-pyrid-2-yl, 3-alkyl-pyrid-2-yloxy, 4-alkyl-pyrid-2-yloxy, 5-alkyl-pyrid-2-yloxy, 6-alkyl-pyrid-2-yloxy, 3-halo-pyrid-2-yloxy, 3-trihaloalkyl-pyrid-2-yloxy, 3-cyano-pyrid-2-yloxy, 5-cyano-pyrid-2-yloxy, 6-dialkoxyalkyl-pyrid-2-yloxy, pyrid-2-yloxy,  $\text{CO}_2\text{CH}(\text{CH}_3)_2$ ,  $-\text{CH}=\text{NOCH}_3$ ,  $-\text{CH}=\text{NOC}_2\text{H}_5$ ,  $-\text{CH}=\text{NOCH}_2\text{CF}_3$ ,  $-\text{CH}=\text{NOCH}_2\text{CH}=\text{CH}_2$ ,  $-\text{CH}=\text{NOCH}_2\text{CN}$ ,  $-\text{CH}=\text{NOCH}(\text{CH}_3)_2$ ,  $-\text{CH}=\text{NOCH}_2\text{C}\equiv\text{CH}$ ,  $-\text{CH}=\text{NOCH}_2\text{CH}_2\text{F}$ ,  $-\text{CH}=\text{NOCH}_2\text{CH}_2\text{OCH}_3$ ,  $-\text{CH}=\text{NOCH}_2\text{OC}_2\text{H}_5$ ,  $-\text{CH}=\text{NOCH}_2\text{CH}_2\text{OCH}_2\text{CH}_2\text{OCH}_3$ ,  $-\text{NHCO}_2\text{CH}_3$ ,  $-\text{NHCO}_2\text{C}_2\text{H}_5$ ,  $-\text{NHCO}_2\text{CH}(\text{CH}_3)_2$ ,  $-\text{NHCO}_2\text{CH}_2-c-\text{C}_3\text{H}_5$ ,  $-\text{CH}(\text{OH})\text{C}_6\text{H}_5$ ,  $p-\text{Cl}$ ,  $-\text{OC}(=\text{O})\text{NHCH}_3$ ,  $-\text{OC}(=\text{O})\text{NHC}_2\text{H}_5$ ,  $-\text{OC}(=\text{O})\text{NHCH}(\text{CH}_3)_2$ ,  $-\text{NHC}(\text{SCH}_3)=\text{NCN}$ , pyrimidin-2-yloxy, 6-halo-pyridazin-3-yloxy, 6-alkoxy-pyridazin-3-yloxy, 6-alkyl-pyridazin-3-yloxy, 2-alkyl-2H-tetrazol-5-yl, 1,3-dioxan-2-yl or 5,5-dialkyl-1,3-dioxan-2-yl; and R is phenyl substituted with  $\text{R}^{14}$ ,  $\text{R}^{15}$ ,  $\text{R}^{16}$ ,  $\text{R}^{17}$ , and  $\text{R}^{18}$ ,



where

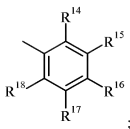
$\text{R}^{14}$ ,  $\text{R}^{15}$ ,  $\text{R}^{16}$  and  $\text{R}^{17}$  are independently selected from halogen, haloalkyl, haloalkoxy or  $\text{R}^{15}$  and  $\text{R}^{16}$  taken together with  $-\text{OCF}_2\text{O}-$ ; and  $\text{R}^{18}$  is hydrogen.

3. The compound of claim 2, wherein X is selected from halogen,  $-\text{CO}_2\text{C}_2\text{H}_5$  or hydroxyl; and  $\text{R}^9$  is selected from  $-\text{OC}_2\text{H}_5$ ,  $-\text{OC}_3\text{H}_7$ ,  $-\text{OCH}(\text{CH}_3)_2$ ,  $-\text{OCH}_2\text{CH}_2\text{OCH}_3$ ,  $-\text{OCH}_2\text{CH}_2\text{CH}_2\text{OCH}_3$ , cyclopropylmethoxy, 2-chlorophenoxy, 3-chlorophenoxy, 4-

chlorophenoxy, pyrimidin-2-yl, pyrid-2-yl, 3-chloro-pyrid-2-yl, 3-methyl-pyrid-2-yloxy, 4-methyl-pyrid-2-yloxy, 5-methyl-pyrid-2-yloxy, 6-methyl-pyrid-2-yloxy, 3-chloro-pyrid-2-yloxy, 3-trifluoromethyl-pyrid-2-yloxy, 3-cyano-pyrid-2-yloxy, 5-cyano-pyrid-2-yloxy, 6-dimethoxymethyl-pyrid-2-yloxy, pyrid-2-yloxy, -CO<sub>2</sub>CH(CH<sub>3</sub>)<sub>2</sub>, -CH=NOCH<sub>3</sub>, -CH=NOC<sub>2</sub>H<sub>5</sub>, -CH=NOCH<sub>2</sub>CF<sub>3</sub>, -CH=NOCH<sub>2</sub>CH=CH<sub>2</sub>, -CH=NOCH<sub>2</sub>CN, -CH=NOCH(CH<sub>3</sub>)<sub>2</sub>, -CH=NOCH<sub>2</sub>C≡CH, -CH=NOCH<sub>2</sub>CH<sub>2</sub>F, -CH=NOCH<sub>2</sub>CH<sub>2</sub>OCH<sub>3</sub>, -CH=NOCH<sub>2</sub>OC<sub>2</sub>H<sub>5</sub>, -CH=NOCH<sub>2</sub>CH<sub>2</sub>OCH<sub>2</sub>CH<sub>2</sub>OCH<sub>3</sub>, -NHCO<sub>2</sub>CH<sub>3</sub>, -NHCO<sub>2</sub>C<sub>2</sub>H<sub>5</sub>, -NHCO<sub>2</sub>CH(CH<sub>3</sub>)<sub>2</sub>, -NHCO<sub>2</sub>CH<sub>2</sub>-*c*-C<sub>3</sub>H<sub>5</sub>, -CH(OH)C<sub>6</sub>H<sub>5</sub>-*p*-Cl, -OC(=O)NHCH<sub>3</sub>, -OC(=O)NHC<sub>2</sub>H<sub>5</sub>, -OC(=O)NHCH(CH<sub>3</sub>)<sub>2</sub>, -NHC(SCH<sub>3</sub>)=NCN, pyrimidin-2-yloxy, 6-chloro-pyridazin-3-yloxy, 6-methoxy-pyridazin-3-yloxy, 6-methyl-pyridazin-3-yloxy, 2-methyl-2H-tetrazol-5-yl, 2-ethyl-2H-tetrazol-5-yl, 1,3-dioxan-2-yl or 5,5-dimethyl-1,3-dioxan-2-yl.

4. The compound of claim 3, wherein X is selected from fluorine, -CO<sub>2</sub>C<sub>2</sub>H<sub>5</sub> or hydroxyl; Y is selected from hydrogen, fluorine, chlorine or hydroxyl; R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup> and R<sup>4</sup> are independently selected from hydrogen, halogen, alkyl, tert-butyl, methoxy, trifluoromethyl, difluoromethoxy, trifluoromethoxy, -OCF<sub>2</sub>CHFCF<sub>3</sub>, -CH<sub>2</sub>(OH)CH<sub>3</sub>, -CH=NOC<sub>2</sub>H<sub>5</sub>, 1,3-dioxolan-2-yl or R<sup>2</sup> and R<sup>3</sup> taken together with -OCF<sub>2</sub>O-; R<sup>8</sup> is hydrogen; R<sup>9</sup> is selected from -OCH<sub>2</sub>CH<sub>2</sub>OCH<sub>3</sub>, -CH=NOCH<sub>3</sub>, -CH=NOC<sub>2</sub>H<sub>5</sub>, -CH=NOCH<sub>2</sub>CN, -CH=NOCH<sub>2</sub>CH<sub>2</sub>OCH<sub>3</sub>, -NHCO<sub>2</sub>CH(CH<sub>3</sub>)<sub>2</sub>, -OC(=O)NHCH(CH<sub>3</sub>)<sub>2</sub>, pyrimidin-2-yl, pyrid-2-yl, 3-chloro-pyrid-2-yl, 3-methyl-pyrid-2-yloxy, 4-methyl-pyrid-2-yloxy, 5-methyl-pyrid-2-yloxy, 6-methyl-pyrid-2-yloxy, 3-chloro-pyrid-2-yloxy, 3-trifluoromethyl-pyrid-2-yloxy, 3-cyano-pyrid-2-yloxy, 5-cyano-pyrid-2-yloxy, 6-dimethoxymethyl-pyrid-2-yloxy, pyrid-2-yloxy, pyrimidin-2-yloxy, 6-chloro-pyridazin-3-yloxy, 6-methoxy-pyridazin-3-yloxy or 6-methyl-pyridazin-3-yloxy; and R is phenyl substituted with R<sup>14</sup>, R<sup>15</sup>, R<sup>16</sup>, R<sup>17</sup>, and R<sup>18</sup>,

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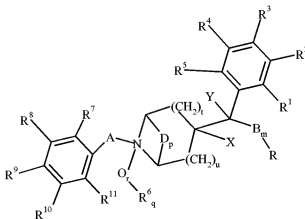


where

$R^{14}$ ,  $R^{15}$ ,  $R^{16}$  and  $R^{17}$  are independently selected from fluorine, chlorine, trifluoromethyl, difluoromethoxy, trifluoromethoxy,  $-\text{OCF}_2\text{CHFCF}_3$  or  $R^{15}$  and  $R^{16}$  taken together with  $-\text{OCF}_2\text{O}-$ .

5. The compound of claim 4, wherein X is hydroxyl; Y is hydrogen;  $R^3$  is haloalkoxy;  $R^9$  is selected  $-\text{OCH}_2\text{CH}_2\text{OCH}_3$ ,  $-\text{CH}=\text{NOCH}_3$ ,  $-\text{CH}=\text{NOC}_2\text{H}_5$ ,  $-\text{CH}=\text{NOCH}_2\text{CN}$ ,  $-\text{CH}=\text{NOCH}_2\text{CH}_2\text{OCH}_3$ ,  $-\text{NHCO}_2\text{CH}(\text{CH}_3)_2$ ,  $-\text{OC}(=\text{O})\text{NHCH}(\text{CH}_3)_2$ , pyrid-2-yloxy, pyrid-2-yl, 3-cyano-pyrid-2-yloxy, 5-methyl-pyrid-2-yloxy, pyrimidin-2-yloxy, pyrimidin-2-yl, 6-chloro-pyridazin-3-yloxy or 6-methoxy-pyridazin-3-yloxy; and  $R^{16}$  is haloalkoxy.

6. A compound of formula I:



**I**

wherein;

m, q and r are independently selected from 0 or 1; t and u are 1; and p is 0;

X is selected from halogen, hydroxyl, hydroxyalkyl, alkyl, alkoxy, haloalkyl, haloalkoxy, thio, alkylthio, acetoxyalkyl, azidoalkyl, aminoalkyl, acetylaminoalkyl, alkylsulfonyl, alkylsulfoxy, pentahalothio, cyano, nitro, acetyloxy, alkylsulfonyloxy, alkylcarbonyl, alkoxycarbonyl, aryl, or aryloxy;

Y is selected from hydrogen, halogen, alkyl, haloalkyl, hydroxyl, hydroxyalkyl, alkoxy, haloalkoxy, thio, alkylthio, pentahalothio, cyano, nitro, alkylsulfonyl, alkylsulfoxy, alkylsulfonyloxy, alkylcarbonyl, alkoxycarbonyl, aryl, or aryloxy;

or

X and Y taken together with  $-\text{OCR}^{12}\text{R}^{13}\text{O}-$ , form a 1,3-dioxolane ring;

where

$\text{R}^{12}$  and  $\text{R}^{13}$  are independently selected from hydrogen, halogen, alkyl, haloalkyl, hydroxyalkyl, alkoxy, haloalkoxy, alkylthio, cyano, nitro, alkylsulfonyloxy, alkylcarbonyl, alkoxycarbonyl, aryl, or aryloxy;

or

$\text{R}^{12}$  and  $\text{R}^{13}$  taken together with  $(=\text{O})$ , form 1,3-dioxol-2-one ring;

$\text{R}^1$ ,  $\text{R}^2$ ,  $\text{R}^3$ ,  $\text{R}^4$ , and  $\text{R}^5$  are independently selected from hydrogen, halogen, alkyl, haloalkyl, hydroxyl, hydroxyalkyl, alkoxy, haloalkoxy, thio, alkylthio, haloalkylthio, pentahalothio, cyano, nitro, alkylsulfonyl, haloalkylsulfonyl, alkylsulfinyl, haloalkylsulfinyl, alkylsulfonyloxy, haloalkylsulfonyloxy, alkylcarbonyl, alkoxycarbonyl, dialkoxyalkylcarbonyl, alkoxycarbonylamino, alkylaminoxyalkyl, alkoxyiminoalkyl, alkenyloxyiminoalkyl, aryl, aryloxy, dioxanyl, dioxolanyl or either of  $\text{R}^1$  and  $\text{R}^2$ , or  $\text{R}^2$  and  $\text{R}^3$ , or  $\text{R}^3$  and  $\text{R}^4$ , or  $\text{R}^4$  and  $\text{R}^5$  taken together with  $-\text{OC}(\text{R}^{19})_2\text{O}-$ ,  $-\text{OC}(\text{R}^{19})_2(\text{R}^{19})_2\text{O}-$ ,  $-\text{OC}(\text{R}^{19})_2(\text{R}^{19})_2-$ ,  $-\text{OC}(\text{R}^{19})=\text{N}-$ , or  $-\text{SC}(\text{R}^{19})=\text{N}-$ , forming a benzo-fused ring, where  $\text{R}^{19}$  is hydrogen, halogen, alkyl or haloalkyl; and, wherein at least one of  $\text{R}^1$ ,  $\text{R}^2$ ,  $\text{R}^3$ ,  $\text{R}^4$ , and  $\text{R}^5$  is other than hydrogen;

$\text{R}^7$ ,  $\text{R}^8$ ,  $\text{R}^9$ ,  $\text{R}^{10}$ , and  $\text{R}^{11}$  are independently selected from hydrogen, halogen, alkyl, hydroxy, hydroxyalkyl, hydroxyalkoxy, alkoxy, alkoxyalkyl, alkoxyiminoalkyl, haloalkoxyiminoalkyl, cyanoalkoxyiminoalkyl, cyanoiminothioalkylamino,



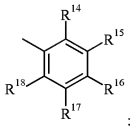
alkenyloxyiminoalkyl, alkynyloxyiminoalkyl, cycloalkoxy, cycloalkylalkoxy, phenoxy, alkoxyacetylphenoxy, alkoxyalkoxy, alkoxyalkoxyalkoxy, alkylthio, alkylsulfonyl, alkylaminosulfonyl, dialkylaminosulfonyl, cycloalkylaminosulfonyl, alkenyloxy, alkynyloxy, haloalkenyloxy, alkylsulfonyloxy, optionally substituted arylalkoxy, cyano, nitro, amino, alkylamino, alkylcarbonylamino, alkoxyacetylaminomethyl, cycloalkylalkoxyacetylaminomethyl, alkenyloxyacetylaminomethyl, alkynyloxyacetylaminomethyl, haloalkylcarbonylamino, alkoxyalkoxyacetylaminomethyl, alkoxyacetylaminomethyl, alkoxyacetylalkoxy, alkenylaminocarbonyloxy, alkynylaminocarbonyloxy, (alkyl)(alkoxyacetylaminomethyl)amino, alkylsulfonylamino, optionally substituted (heteroaryl)(alkoxyacetylaminomethyl)amino, optionally substituted arylcarbonylamino, alkoxyacetylaminomethyl, alkenylaminocarbonyloxy, alkylaminocarbonylamino, dialkylaminocarbonylamino, alkylamino(thiocarbonyl)amino, dialkylphosphorureidyl, acetoxyalkoxy, sulfonyloxyalkoxy, dialkoxyalkoxy, trialkoxyalkoxy, dialkoxyalkylacetal, trialkoxymethylorthoester, cyclic acetal, optionally substituted cyclic acetal, optionally substituted thienyl, optionally substituted 1,3-thiazolylalkoxy, optionally substituted aryl, optionally substituted aryloxy, optionally substituted aryloxyalkyl, optionally substituted arylaminocarbonyloxy, optionally substituted arylalkoxyacetylaminomethyl, optionally substituted heteroaryl, optionally substituted heteroaryloxy, optionally substituted pyrrolyl, optionally substituted pyrazolyl, optionally substituted pyrazinyloxy, optionally substituted cycloalkylcarbonylamino, optionally substituted 1,3-oxazolinyloxy, optionally substituted 1,3-oxazolinyloxy, optionally substituted 1,3-oxazolinyloxy, optionally substituted 1,2,4-triazolyl, optionally substituted 1,2,3-thiadiazolyl, optionally substituted 1,2,5-thiadiazolyl, optionally substituted 1,2,5-thiadiazolyloxy, optionally substituted 2H-tetrazolyl, optionally substituted pyridyl, optionally substituted pyridyloxy, optionally substituted pyridylaminomethyl, optionally substituted pyrimidinyl, optionally substituted pyrimidinyl, optionally substituted 3,4,5,6-tetrahydropyrimidinyl, optionally substituted pyridazinyloxy, or optionally substituted 1,2,3,4-tetrahydronaphthalenyl, wherein the optional substituent is selected from one or more of halogen, alkyl, haloalkyl, alkoxy, cyano, nitro, amino, alkylcarbonyl, alkoxyacetylaminomethyl,

alkoxyiminoalkyl, dialkylacetal, alkylthiol, alkylsulfoxide, or alkoxycarbonylamino; and, wherein at least one of  $R^7$ ,  $R^8$ ,  $R^9$ ,  $R^{10}$ , and  $R^{11}$  is other than hydrogen;

$R$  is alkyl, cycloalkyl, alkenyl, alkoxycarbonyl, optionally substituted pyrid-2-yl wherein the optional substituent is selected from hydrogen, halogen, haloalkoxy or haloalkyl,

or

substituted phenyl have the following structure,



where

$R^{14}$ ,  $R^{15}$ ,  $R^{16}$ ,  $R^{17}$ , and  $R^{18}$  are independently selected from hydrogen, halogen, alkyl, haloalkyl, hydroxyl, hydroxyalkyl, alkoxy, haloalkoxy, thio, alkylthio, haloalkylthio, pentahalothio, cyano, nitro, alkylsulfonyl, haloalkylsulfonyl, alkylsulfinyl, haloalkylsulfinyl, alkylsulfonyloxy, haloalkylsulfonyloxy, alkylcarbonyl, alkoxycarbonyl, dialkoxyalkylcarbonyl, alkoxycarbonylamino, alkylaminoxyalkyl, alkoxyiminoalkyl, alkenyloxyiminoalkyl, aryl, aryloxy, dioxanyl, dioxolanyl or either of  $R^{14}$  and  $R^{15}$ , or  $R^{15}$  and  $R^{16}$ , or  $R^{16}$  and  $R^{17}$ , or  $R^{17}$  and  $R^{18}$  taken together with  $-\text{OC}(\text{R}^{19})_2\text{O}-$ ,  $-\text{OC}(\text{R}^{19})_2(\text{R}^{19})_2\text{O}-$ ,  $-\text{OC}(\text{R}^{19})_2(\text{R}^{19})_2-$ ,  $-\text{OC}(\text{R}^{19})=\text{N}-$ , or  $-\text{SC}(\text{R}^{19})=\text{N}-$ , forming a benzo-fused ring, where  $\text{R}^{19}$  is hydrogen, halogen, alkyl or haloalkyl; and, wherein at least one of  $R^{14}$ ,  $R^{15}$ ,  $R^{16}$ ,  $R^{17}$ , and  $R^{18}$  is other than hydrogen;

$A$  is selected from  $-\text{CH}_2-$ ,  $-\text{CH}_2\text{CH}_2-$ ,  $-\text{CH}_2\text{CH}_2\text{CH}_2-$ ,  $-\text{OCH}_2\text{CH}_2-$ ,  $-\text{OCH}_2\text{CH}_2\text{CH}_2-$ ,  $-\text{OCH}_2\text{CH}_2\text{CH}_2\text{CH}_2-$ ,  $-\text{OCH}_2\text{CH}(\text{OH})\text{CH}_2-$ ,  $-\text{NHCH}_2\text{CH}_2-$ ,  $-\text{N}(\text{CH}_3)\text{CH}_2\text{CH}_2-$ ,  $-\text{N}[\text{C}(=\text{O})\text{CH}_3]\text{CH}_2\text{CH}_2-$ , or  $-\text{N}[\text{C}(=\text{O})\text{OCH}_3]\text{CH}_2\text{CH}_2-$ ;

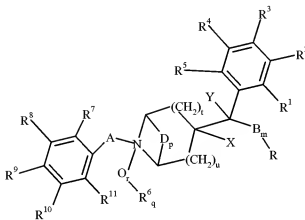
B is selected from  $-\text{O}-$ ,  $-\text{S}-$ ,  $-\text{CH}_2\text{O}-$ ,  $-\text{OCH}_2-$ ,  $-\text{OC}(=\text{O})\text{NH}-$ ,  $-\text{OC}(=\text{O})\text{O}-$ , or  $-\text{NHSO}_2-$ ;

$\text{R}^6$  is selected from alkyl, haloalkyl, hydroxyalkyl, alkoxyalkyl, dialkylaminoalkyl, alkylaminocarbonyloxyalkyl, alkylthioalkyl, alkylsulfonylalkyl, alkylcarbonyloxyalkyl, alkoxycarbonylalkyl, carboxyalkyl, arylalkyl, arylcarbonyl, sulfonato, or sulfonatoalkyl, and may bear a negative charge resulting in an inner salt; and a separate ion is chloride, bromide, iodide, or an alkyl or phenyl sulfate or sulfonate;

and

agriculturally-acceptable salts thereof.

7. A compound of formula I:



**I**

wherein;

r is selected from 0 or 1; m, q and p are 0; t and u are 1;

A is  $-\text{CH}_2-$ ;

X is selected from halogen or hydroxyl;

Y is selected from hydrogen or hydroxyl;

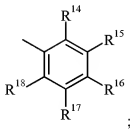
$\text{R}^1$ ,  $\text{R}^2$ ,  $\text{R}^3$  and  $\text{R}^4$  are independently selected from hydrogen, halogen, alkyl, alkoxy, haloalkyl, haloalkoxy or  $-\text{CH}=\text{NOC}_2\text{H}_5$ ;

R<sup>5</sup> is hydrogen;

R<sup>7</sup>, R<sup>8</sup>, R<sup>10</sup> and R<sup>11</sup> are hydrogen;

R<sup>9</sup> is selected from -OC<sub>2</sub>H<sub>5</sub>, -OC<sub>3</sub>H<sub>7</sub>, -OCH(CH<sub>3</sub>)<sub>2</sub>, -OCH<sub>2</sub>CH<sub>2</sub>OCH<sub>3</sub>, -OCH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>OCH<sub>3</sub>, cyclopropylmethoxy, 2-chlorophenoxy, 3-chlorophenoxy, 4-chlorophenoxy, pyrimidin-2-yl, pyrid-2-yl, 3-chloro-pyrid-2-yl, 3-methyl-pyrid-2-yloxy, 4-methyl-pyrid-2-yloxy, 5-methyl-pyrid-2-yloxy, 6-methyl-pyrid-2-yloxy, 3-chloro-pyrid-2-yloxy, 3-trifluoromethyl-pyrid-2-yloxy, 3-cyano-pyrid-2-yloxy, 5-cyano-pyrid-2-yloxy, 6-dimethoxymethyl-pyrid-2-yloxy, pyrid-2-yloxy, CO<sub>2</sub>CH(CH<sub>3</sub>)<sub>2</sub>, -CH=NOCH<sub>3</sub>, -CH=NOC<sub>2</sub>H<sub>5</sub>, -CH=NOCH<sub>2</sub>CF<sub>3</sub>, -CH=NOallyl, -CH=NOCH<sub>2</sub>CH=CH<sub>2</sub>, -CH=NOCH<sub>2</sub>CN, -CH=NOCH(CH<sub>3</sub>)<sub>2</sub>, -CH=NOCH<sub>2</sub>C≡CH, -CH=NOCH<sub>2</sub>CH<sub>2</sub>F, -CH=NOCH<sub>2</sub>CH<sub>2</sub>OCH<sub>3</sub>, -CH=NOCH<sub>2</sub>OC<sub>2</sub>H<sub>5</sub>, -CH=NOCH<sub>2</sub>CH<sub>2</sub>OCH<sub>2</sub>CH<sub>2</sub>OCH<sub>3</sub>, -NHCO<sub>2</sub>CH<sub>3</sub>, -NHCO<sub>2</sub>C<sub>2</sub>H<sub>5</sub>, -NHCO<sub>2</sub>CH(CH<sub>3</sub>)<sub>2</sub>, -NHCO<sub>2</sub>CH<sub>2</sub>-*c*-C<sub>3</sub>H<sub>5</sub>, -CH(OH)C<sub>6</sub>H<sub>5</sub>-*p*-Cl, -OC(=O)NHCH<sub>3</sub>, -OC(=O)NHC<sub>2</sub>H<sub>5</sub>, -OC(=O)NHCH(CH<sub>3</sub>)<sub>2</sub>, -NHC(SCH<sub>3</sub>)=NCN, pyrimidin-2-yloxy, 6-chloro-pyridazin-3-yloxy, 6-methoxy-pyridazin-3-yloxy, 6-methyl-pyridazin-3-yloxy, 2-methyl-2H-tetrazol-5-yl, 2-ethyl-2H-tetrazol-5-yl, 1,3-dioxan-2-yl or 5,5-dimethyl-1,3-dioxan-2-yl; and

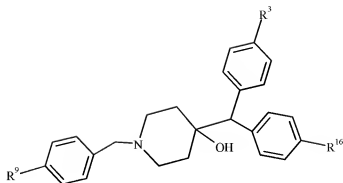
R is phenyl substituted with R<sup>14</sup>, R<sup>15</sup>, R<sup>16</sup>, R<sup>17</sup>, and R<sup>18</sup>,



where

R<sup>16</sup> is selected from haloalkyl or haloalkoxy, and R<sup>14</sup>, R<sup>15</sup>, R<sup>17</sup> and R<sup>18</sup> are hydrogen.

8. A compound of formula I-H:

**I-H**

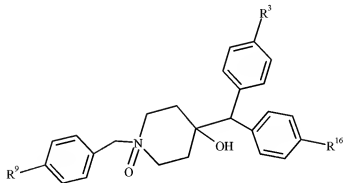
wherein,

R<sup>3</sup> is haloalkyl or haloalkoxy;

R<sup>9</sup> is selected from -OCH<sub>2</sub>CH<sub>2</sub>OCH<sub>3</sub>, pyrid-2-yloxy, pyrid-2-yl, 3-cyano-pyrid-2-yloxy, 5-methyl-pyrid-2-yloxy, pyrimidin-2-yloxy, pyrimidin-2-yl, 6-chloro-pyridazin-3-yloxy or 6-methoxy-pyridazin-3-yloxy; and

R<sup>16</sup> is haloalkyl or haloalkoxy.

9. A compound of formula **I-J**:

**I-J**

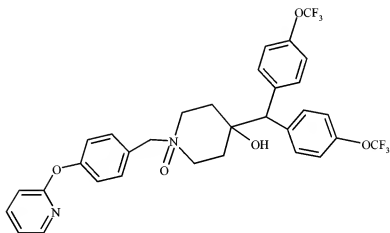
wherein,

R<sup>3</sup> is haloalkyl or haloalkoxy;

R<sup>9</sup> is selected from -OCH<sub>2</sub>CH<sub>2</sub>OCH<sub>3</sub>, pyrid-2-yloxy, pyrid-2-yl, 3-cyano-pyrid-2-yloxy, 5-methyl-pyrid-2-yloxy, pyrimidin-2-yloxy, pyrimidin-2-yl, 6-chloro-pyridazin-3-yloxy or 6-methoxy-pyridazin-3-yloxy; and

R<sup>16</sup> is haloalkyl or haloalkoxy.

10. The compound:



namely, 4- {bis[4-(trifluoromethoxy)phenyl]methyl}-4-hydroxy-1-[(4-(2-pyridyloxy)phenyl)methyl]piperidin-1-oxide, and agriculturally-acceptable salts thereof.

11. A composition containing an insecticidally effective amount of a compound of claim 1 in admixture with at least one agriculturally acceptable extender or adjuvant.

12. A composition containing an insecticidally effective amount of a compound of claim 2 in admixture with at least one agriculturally acceptable extender or adjuvant.

13. A composition containing an insecticidally effective amount of a compound of claim 3 in admixture with at least one agriculturally acceptable extender or adjuvant.

14. A composition containing an insecticidally effective amount of a compound of claim 4 in admixture with at least one agriculturally acceptable extender or adjuvant.

15. A composition containing an insecticidally effective amount of a compound of claim 5 in admixture with at least one agriculturally acceptable extender or adjuvant.

16. A composition containing an insecticidally effective amount of a compound of claim 6 in admixture with at least one agriculturally acceptable extender or adjuvant.

17. A composition containing an insecticidally effective amount of a compound of claim 7 in admixture with at least one agriculturally acceptable extender or adjuvant.

18. A composition containing an insecticidally effective amount of a compound of claim 8 in admixture with at least one agriculturally acceptable extender or adjuvant.

19. A composition containing an insecticidally effective amount of a compound of claim 9 in admixture with at least one agriculturally acceptable extender or adjuvant.

20. A composition containing an insecticidally effective amount of a compound of claim 10 in admixture with at least one agriculturally acceptable extender or adjuvant.
21. The insecticidal composition of claim 11, further comprising one or more second compounds.
22. The insecticidal composition of claim 12, further comprising one or more second compounds.
23. The insecticidal composition of claim 13, further comprising one or more second compounds.
24. The insecticidal composition of claim 14, further comprising one or more second compounds.
25. The insecticidal composition of claim 15, further comprising one or more second compounds.
26. The insecticidal composition of claim 16, further comprising one or more second compounds.
27. The insecticidal composition of claim 17, further comprising one or more second compounds.
28. The insecticidal composition of claim 18, further comprising one or more second compounds.
29. The insecticidal composition of claim 19, further comprising one or more second compounds.



30. The insecticidal composition of claim 20, further comprising one or more second compounds.

31. A method of controlling insects, comprising applying an insecticidally effective amount of a composition of claim 11 to a locus where insects are present or are expected to be present.

32. A method of controlling insects, comprising applying an insecticidally effective amount of a composition of claim 12 to a locus where insects are present or are expected to be present.

33. A method of controlling insects, comprising applying an insecticidally effective amount of a composition of claim 13 to a locus where insects are present or are expected to be present.

34. A method of controlling insects, comprising applying an insecticidally effective amount of a composition of claim 14 to a locus where insects are present or are expected to be present.

35. A method of controlling insects, comprising applying an insecticidally effective amount of a composition of claim 15 to a locus where insects are present or are expected to be present.

36. A method of controlling insects, comprising applying an insecticidally effective amount of a composition of claim 16 to a locus where insects are present or are expected to be present.

37. A method of controlling insects, comprising applying an insecticidally effective amount of a composition of claim 17 to a locus where insects are present or are expected to be present.

38. A method of controlling insects, comprising applying an insecticidally effective amount of a composition of claim 18 to a locus where insects are present or are expected to be present.

39. A method of controlling insects, comprising applying an insecticidally effective amount of a composition of claim 19 to a locus where insects are present or are expected to be present.

40. A method of controlling insects, comprising applying an insecticidally effective amount of a composition of claim 20 to a locus where insects are present or are expected to be present.